

**TAMIL NADU PUBLIC SERVICE COMMISSION
SYLLABUS**

Code No.165

SUBJECT:COMPUTER APPLICATIONS (Degree Standard)

UNIT-I: FUNDAMENTALS OF INFORMATION TECHNOLOGY , INTERNET CONCEPTS & WEB TECHNOLOGY

Introduction to Computer – Classification of Digital Computer System – Computer Architecture – Memory Units – Auxiliary Storage Devices – Input and Output Devices. Introduction to Computer Software – Operating System – Programming Languages – General Software Features and trends.

Internet and the World wide web: The world wide web.Browsing the web-Web address-web browser basics-Strong and managing(book marks)-Surfing the web with web browser(APPLE CYBER DOG, LYNX, HOT JAVA, Microsoft Internet Explorer-Netscape Navigator)-searching the web directory-search engines-navigation tools. Email: Sending-Reading-Replying-Deleting-Exiting-Sending Mail to more than one person-sending folder-forwarding a mail- checking the spelling-attachments.Usenet-Telnet-FTP-Chat-News group's. HTML: Overview of HTML-adding structure to a page formatting text and pages-linking page to the world-including picture-clearing lists-arranging items within tables-getting feedback from form splitting a page into frames

UNIT-II: C PROGRAMMING & OOPS CONCEPTS

Data Types - Variables - Operators - Control structures - Looping structures - Arrays - Strings - Built-in-functions. Function - Scope of Variables - Advanced features of functions. Pointer - Pointers to Array - Pointer Array - Pointer Arithmetic - Pointer of Pointer - Functions and Pointers -Structures and Pointers - Dynamic Allocation - Function pointer.

Introduction: Advantages of OOP-Characteristics of OO languages: classes - objects-inheritance-reusability - creating new data types - polymorphism and overloading - C++ programming basics - Loops and decisions. Objects and Classes: A simple class - C++ objects as physical objects and data types -constructors - destructors - objects as function arguments - returning objects from functions -structures and classes-class, object and memory - static class data - arrays and strings. Operator overloading: Unary and binary operators - data conversion-inheritance: derived class constructors - overloading member functions - class hierarchies - public and private inheritance - levels of inheritance - multiple inheritance - pointers.

UNIT-III: DIGITAL COMPUTER FUNDAMENTALS

Number Systems and Logic Circuits: Number systems - Decimal, Binary, Octal, Hexadecimal - conversion from one to another - Characters and codes - ASCII code, Excess-3 code, gray code - binary addition, subtraction, multiplication and division - unsigned binary numbers - signed magnitude numbers - complements in number systems - Truth tables, AND, OR, NOT, NOR & NAND gates, EX-OR gates - parity generators and checkers.Booleen Algebra and Digital Circuits : Booleen laws and theorems - De Morgan's theorems - Duality theorem - simplification of sum of

product and product of sum expressions - Karnaugh map and simplifications - Simple arithmetic circuits - Half and Full adders - Binary adder/subtractor - BCD adder - Data processing circuits - Multiplexers - Demultiplexers - Encoders and Decoders.

UNIT-IV: SOFTWARE ENGINEERING

Software Project Planning: Size Estimation-Cost Estimation Models-The Constructive Cost Model(COCOMO)-COCOMO II-The Putnam Resource Allocation Models-Software Risk Managements - Software Design: Definition-Modularity-Strategy of Designs-Function Oriented Design-IEEE Recommended Practice for Software Design Descriptions-Object Oriented Design.Software Metrics: Meaning -Token Count-Data Structure Metrics-Information Flow Metrics-Metrics Analysis - Software Reliability: Basic Concepts-Software Quality-Software Reliability Models-Capability Maturity Models-ISO 9000. Software Testing: Testing Process-Some Technologies-Functional Testing-Structural Testing-Levels of Testing-Debugging-Testing Tools.

UNIT-V: MANAGEMENT INFORMATION SYSTEMS

Fundamentals of Information System – Overview of Information of System Solving Business Problems with Information Systems : System Approach to Problem Solving – Developing Information System Solution – Information Systems for Strategic Advantages – Fundamentals of Strategic Advantage - Strategic Applications and Issues in It; Managing IT : Enterprise and Global Management. Business applications of Information Technology : The Internet and Electronic Commerce – Fundamentals of Electronic Commerce – Information System for Business Operations : Business Information System – Transaction – processing Systems. Information systems for Managerial Decision Support : Decision Support Systems – Artificial Intelligence technology in Business – Managing IT – Planning for Business change with IT – Implementing business change with IT – Security & Control Issues in I/S – Ethical and societal challenges of Information Technology.

UNIT-VI: DATA STRUCTURES

Arrays: Ordered Lists-Representation of arrays. Stacks and queues: fundamentals-evaluation of expressions-multiple stacks and queues. Linked Lists: Singly Linked Lists-Linked stacks and queues-polynomial addition-Doubly linked lists and dynamic-Garbage collection and compaction. Trees: Basic terminology-Binary trees-Binary tree representation-Binary tree traversal.

UNIT-VII: DATA BASE SYSTEMS

Introduction: Objectives - Early Information Systems - Problems with Early Information Systems - Organization of Data Base - Components of Data Base Management System-Data Models - Entity - Relationship Model - Network Data Model, Hierarchical Data Model - Semantic Data Modelling.File Organization - Sequential file organization - The indexed sequential file organization -Creation and manipulating of indexed sequential file - Hashing - Key-to-address transformation.Relational Data Model : Introduction - Basic definition and terminology - Relational algebra.

UNIT -VIII: MULTIMEDIA AND ITS APPLICATIONS

Introduction to Multimedia – CDROM and the Multimedia highway – Uses of Multimedia – Introduction to making multimedia – Multimedia skills. Multimedia hardware and software – Connections – Memory and storage devices – Input devices – Output devices – Communication devices. Basic software tools – Text editing and word processing tools – Painting and drawing tools – 3-D modelling and animation tools – Image editing tools – Animation, video and digital movie tools. Making instant multimedia – Multimedia authoring tools. Multimedia Building Blocks – Text – Sound – Multimedia System Sounds – MIDI versus Digital Audio – Digital Audio – Making MIDI Audio – Audio File Formats – Production tips - Images – Animation - Video.

UNIT-IX: COMPUTER NETWORKS

Introduction to Computer Networks and Data Communication: Need for computer networks - evolution - Data Communication - Data Transmission - Transmission media - Classification of Networks - Switching and Routing - Routing - Multiplexing and Concentration Concentrator - Terminal Handling - Components of a Computer Network. Network Standards and OSI - Need for network standard - OSI reference model - Physical layer - Data link layer - Network layer - Transport layer - Session layer - Application layer.

UNIT-X: OPERATING SYSTEMS

Computer Science overview-Basic elements-interrupts-cache memory-I/O communication techniques-evolution-developments leading to modern OS.Process description and control-process-process states-process- control-Uniprocessor scheduling-types-scheduling algorithms Mutual exclusion and synchronization-concurrency-semaphores-monitors-message passing-readers and writers problem. Deadlock and starvation-principles-prevention-avoidance-detection-dining philosopher's problem. Memory Management-requirements-partitioning-paging-segmentation-virtual memory-hardware and control structures-operating system software.I/O management and disk scheduling-I/O devices-I/O buffering -disk scheduling. File management-organization and access-File directories-file sharing-record blocking-secondary storage management.

BOOKS FOR REFERENCES:

1. Alexis Leon. Mathews Leon, Fundamentals of Information Technology, TECH World
2. Joe krayank & Joe Habraken, “ Internet 6 in 1”, Prentice Hall of India Private Limited, New Delhi, 1998.
3. Internet Complete, BPB publications, New Delhi,1998
4. E.Balagurusamy, “Programming in ANSI C”, Tata McGraw Hill, New Delhi,II Edition, 2002.
5. E.Balagurusamy, Object Oriented Programming with C++ , Tata Mcgraw Hill, 1985
6. M. Morris Mano ,Computer System Architecture,, Pearson Education, III Edition
7. Roger S.Pressman – “Software Engineering A Practitioner’s Approach”, 5th edition, McGraw Hill, 2001
8. James A. O’Brien,Management Information Systems–, 4th edition, Galgotia publications, 1999.

- 9.** Ellis Horowitz and Sartaj Sahni, “Fundamentals of Data structure”, Galgotia Publications, New Delhi.1985.
- 10.** Abraham Silberschatz & Henry F. Korth,Data Base System Concepts-, TMH, IV Edition, 2002.
- 11.** Tay Vaughan, “Multimedia Making It work”, Fifth Edition , Tata Mc Graw Hill Edition 2001.
- 12.** Andrew S Tanenbaum, “Computer Networks”, Prentice Hall of India, New Delhi,1999.
- 13.** E.Madnick and John Donovan, Operating Systems,Concepts and Design- TMH, New Delhi